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FEDERAL-STATE
COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for

COLORADO RIVER DRAINAGE BASIN

May 1, 1949



by

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were collected by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

MAY 1, 1949

WATER SUPPLY OUTLOOK
COLORADO RIVER DRAINAGE

Snow cover on the high mountain watersheds of the Colorado River and its tributaries in Colorado dropped sharply during April. Precipitation during this period was light and temperatures were above normal. Snow-water content on even the highest courses declined during the month. Because of mid-winter snow summer runoff is expected to be normal or above on most tributaries with relatively heavier discharges on the San Juan and Green River tributaries. Soil moisture conditions over western Colorado are good. Stream flow is about normal except in the San Juan drainage where current stream flow is high. Reservoir storage in Arizona is considerably above last year due to heavy mid-winter snow. However, the total stream flow has not been as much as expected.

COLORADO RIVER AND ITS TRIBUTARIES IN COLORADO

Colorado River (above Grand Junction): The remaining snow cover on the Colorado River above Grand Junction is somewhat less than average as shown by late season snow surveys. Summer flow of the Eagle Blue and Frazer River may be expected to be near average or slightly less. On the extreme Upper Colorado River, snow cover is still relatively high. Soil moisture is reported as good throughout the drainage. Stream flow is about average. Range and crop conditions are listed as good. Storage in Green Mountain Reservoir is 50,400 acre-feet which is the same as for May 1, 1948.

Gunnison River: The water supply outlook for the Gunnison River is similar to that for the Colorado River above Grand Junction. Stream flow is currently well above normal due to heavy melting in April. Soil moisture conditions are described as good. Storage in Taylor Park Reservoir is now 62,000 acre-feet as compared to 88,000 acre-feet a year ago. The expected April-September discharge of Gunnison at Grand Junction has declined about ten percent during April and is now 1,600,000 acre-feet.

Yampa and White Rivers: The water stored in the snow declined rather severely on these watersheds during April, but summer flow is still expected to be well above normal. The prospect of unusually heavy peak flows as were expected a month ago has largely disappeared. The estimated April-September, 1949 flow of the White River at Meeker is 400,000 acre-feet, the Little Snake at Lily 425,000; Elk at Clark, 275,000; and the Yampa at Steamboat Springs, 250,000.

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San Juan and Animas Rivers: As with other streams in western Colorado, the snow-water content on the headwaters of the San Juan and Animas Rivers declined considerably during April, especially the low and middle elevations. However, due to mid-winter snow accumulation, the summer flow of these streams should be well above normal. Peak flows are not expected to be unusually high. The estimated April-September flow for the San Juan at Rosa in New Mexico is now 900,000 acre-feet and for the Animas at Durango, 650,000. The storage in Vallecito Reservoir is now 32,000 acre-feet which is about the same as April 1. Soil moisture conditions throughout these drainages are described as excellent.

Dolores River: Although there has been a decline in snow cover on the head waters of the Dolores and San Miguel Rivers during April, the water content of the snow at high elevations is well above normal. The April-September flow of the Dolores River is expected to be about 475,000 acre-feet. The flow of the Dolores River on about May 1 was 2,500 second-feet, which is substantially above normal. The peak flow of the river this year is expected to be relatively high. Soil moisture conditions in the Cortez area are reported as fair since recent precipitation has been deficient.

GREEN RIVER IN WYOMING

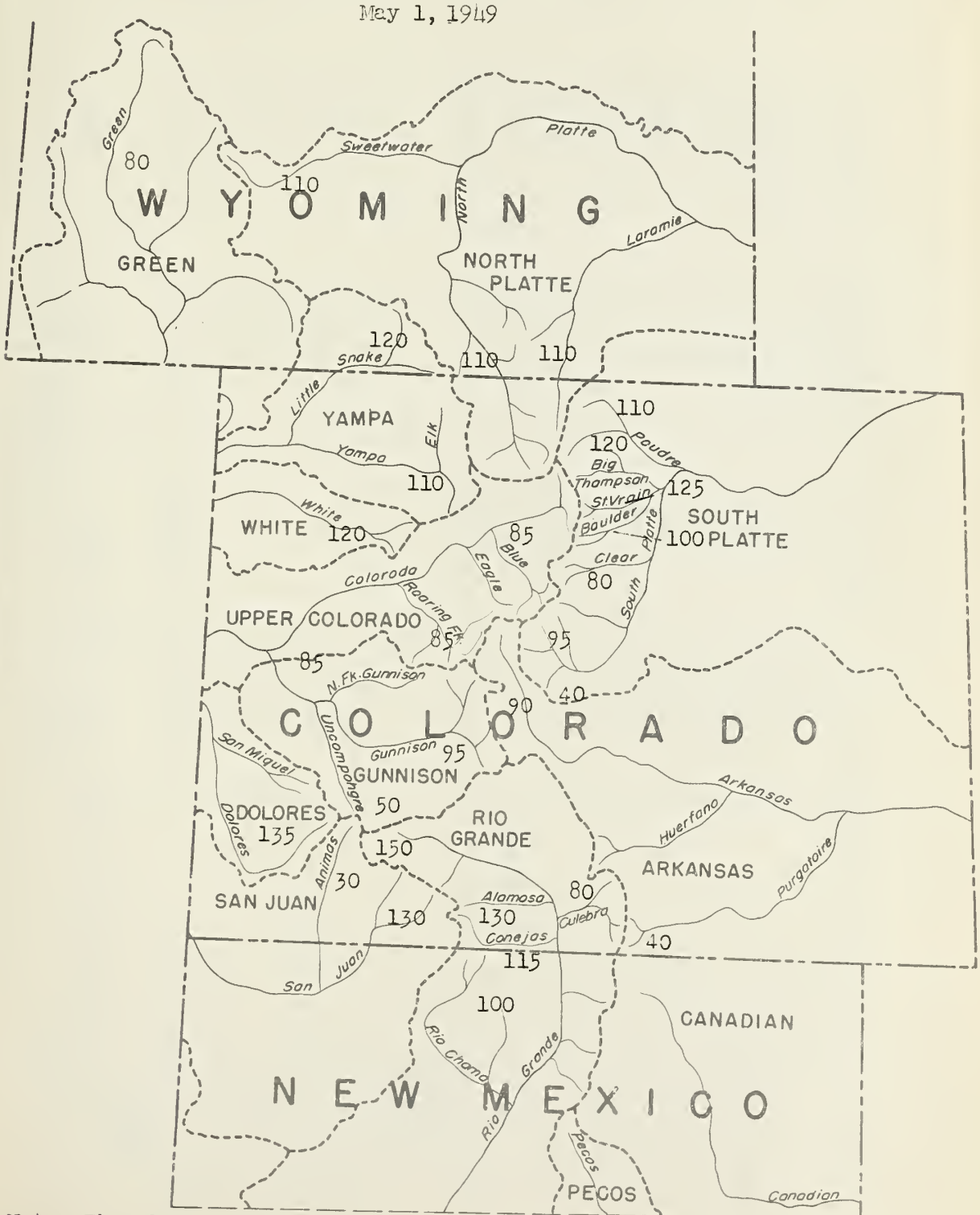
The water content of the snow remaining on the snow courses on the Green River watersheds is about 80 percent of normal which represents a substantial drop from April 1. The stream flow is reported as above normal as of May 1. The estimated April-September flow of the Green River at Linwood, Utah, has declined about 20 percent during the past month, and is now 1,100,000 acre-feet. Range conditions are reported as good.

COLORADO RIVER & TRIBUTARIES IN ARIZONA

Although the stream flow from last winter's snow fall was not as great as expected, the water supply outlook for Arizona is much improved over the past three seasons. Precipitation for the past three months has been below normal. The soil in the Salt River Valley is dry and there is little moisture in the subsoil. Storage in the four major reservoirs on the Salt River is now 804,000 acre-feet as compared to about 400,000 a year ago. This current storage is almost equal to the past ten-year average. Storage in Bartlett Reservoir in the Verde River is 132,000 acre-feet compared to a ten-year average of 75,000. In San Carlos Reservoir there is now stored 253,000 acre-feet; a year ago it was 14,000 and the past ten-year average is 250,000. The ground water table in the Valley is now at the lowest on record. The average water depth as reported by the U. S. Geological Survey was 69 feet about January 1, 1949. This decline has continued since 1942.

WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal
May 1, 1949



Note: The above numbers represent actual snow cover on the snow courses on the watershed in percent of normal as of May 1, 1949. These numbers do not necessarily coincide with expected summer runoff.

COLORADO RIVER DRAINAGE BASIN
STREAM FLOW FORECASTS, May 1, 1949

Basin and Stream	Forecast 1949	April-Sept., Incl., Streamflow, Acre Feet Measured Runoff 1948	1947	1946	10-year Avg. 1938-1947
GREEN					
Green at Linwood, Utah	1,100,000	1,077,000	1,817,000	1,181,000	1,160,000
Little Snake at Lilly	425,000		341,560	272,000	333,000
Elk at Clark	275,000		234,000	184,000	206,000
Yampa at Steamboat Springs	350,000		333,000	225,000	263,000
White at Meeker	400,000	331,000	404,000	248,000	316,000
COLORADO					
Colorado at Glenwood Springs	1,500,000	1,477,000	1,880,000	1,148,000	1,473,000
Roaring Fork at Glenwood Springs	900,000	887,000	1,008,000	635,000	754,000
Gunnison at Grand Junction	1,600,000	1,966,000	1,509,000	906,000	1,501,000
Uncompahgre at Colona	225,000		178,000	110,000	171,000
San Juan at Rosa, N.M.	900,000	797,000	440,000	280,000	700,000
Los Pinos Near Bayfield	200,000	321,000	185,000	185,000	224,000
Animas at Durango	650,000	566,000	540,000	340,000	516,000
San Miguel at Naturita	300,000	280,130	180,000	133,000	275,000
Colorado near Grand Canyon, Ariz.	11,200,000	10,287,000	10,986,000	6,505,000	9,768,000

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

COLORADO RIVER BASIN

STATUS OF RESERVOIR STORAGE, MAY 1, 1949

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (THOUS. A.F.)	THOUSANDS ACRE FEET IN STORAGE ABOUT MAY 1				
			1949	1948	1947	1946	10-year Av. 1938-1947*
COLORADO DRAINAGE							
Taylor River	Taylor Park	106.2	62.2	87.8	68.0	90.9	66.7
Los Pinos River	Vallecito	126.3	32.3	20.4	66.2	58.7	41.2
Groundhog Creek	Groundhog	21.7	8.5	16.7	12.0	--	9.9
Blue River	Green Mountain	146.9	50.4	50.7	61.0	56.2	53.3
Colorado River	Lake Mead	27935.0	17869.0	19144.0	16283.0	17863.0	19357.3
Colorado River	Lake Havasu	688.0	656.4	666.8	657.6		554.5
SALT AND GILA DRAINAGE							
Salt River	Roosevelt	1420.0	(A)	153.2	44.4	299.8	648.8
" "	Horse Mesa	245.0		155.0	237.5	223.8	215.7
" "	Mormon Flat	58.0		43.1	47.3	48.1	48.1
" "	Stewart Mt.	70.0		47.4	57.3	45.2	53.1
Verde River	Bartlett	179.5	131.9	21.3	0.0	17.5	74.9
Verde River	Horseshoe	67.0	50.8	2.6			
Aqua Fria River	Carl Pleasant	173.0	30.6	--		3.6	35.8
Gila River	San Carlos	1200.0		14.4	0.4	14.7	250.8

*Some for shorter periods

(A) Total storage in Salt River Reservoirs, May 1, 1949, 804,700 Acre-Feet

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
COLORADO RIVER BASIN
May 1, 1949

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1949 Water Content in Percent of	
	Thirteen year Avg.*	1948	1949	Thirteen year Avg.*	1948	1949		Thirteen year Avg.*	1948	1949	Thirteen year Avg.*	1948
COLORARO RIVER	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Green River	19.4	23.8	14.8	7.3	8.4	6.0	6	38	35	41	82	71
Colorado River**	37.2	39.9	33.7	13.2	14.8	12.1	23	35	37	36	92	82
Roaring Fork	25.7	29.9	17.8	10.6	10.8	7.3	3	41	36	41	69	68
Yampa River	42.0	46.3	40.9	17.5	19.6	18.5	5	42	42	45	106	94
White River	31.2	35.2	33.8	12.2	12.6	14.8	2	39	36	44	121	117
Gunnison River	37.6	42.7	34.1	14.2	16.7	13.3	10	38	39	39	94	80
Dolores River	16.8	--	14.5	6.1	--	8.2	3	36	--	57	134	--
San Juan River	29.1	32.7	33.1	12.7	15.7	16.7	5	44	48	50	132	106
Animas River	12.6	7.9	3.7	4.7	3.1	1.3	3	37	39	35	28	42

**Above Grand Junction. *Some for shorter periods.

PRECIPITATION DATA

WATERSHED	STATE	Precipitation* October 1 to April 30	Departure from Normal	Precipitation* April	Departure from Normal
		Inches	Inches	Inches	Inches
Colorado	Colorado	11.99	+1.01	1.27	-0.49
Green	Wyoming	5.91	+0.09	0.36	-0.68
San Juan	New Mexico	6.65	+0.18	0.55	-0.39
Colorado	Arizona	9.25	-0.15	0.31	-0.70
Gila	Arizona	7.97	+1.16	0.84	+0.39

COLORADO RIVER DRAINAGE SNOW SURVEYS
May 1, 1949

Drainage Basin and Snow Course	Location					Snow Cover Measurements						
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1949	1948	1947	Past Record Yrs. of Rec.	Av. Water Content (Inches)
						COLORADO RIVER						
COLORADO RIVER (above Grand Junction)												
Cameron Pass*	1 Colo.	2	6N	76W	10300	5/1	61.8	24.5	21.4	25.9	13	23.6
Park View*	7 "	24	5N	78W	9200	5/2	22.4	7.0	6.3	10.9	13	6.8
Phantom Valley	12 "	7	5N	75W	9300	4/27	17.2	6.1	5.6	10.4	13	5.7
Hoosier Pass	14 "	13	8S	78W	11400	4/29	30.9	9.1	14.0	14.1	13	11.1
Berthoud Pass	16 "	35	2S	75W	9700	5/2	40.7	14.3	16.5	20.3	13	14.6
Tennessee Pass	19 "	21	8S	80W	10200	4/28	11.4	3.4	9.3	8.6	13	5.4
Ind. Pass Tunnel	33 "	30	11S	82W	10200	5/3	34.9	13.7	20.3	27.4	13	17.1
N.Lost Trail Cr.	34 "	20	11S	87W	9200	4/30	14.4	6.7	10.9	10.6	13	10.2
M.Fork Camp Gr.	37 "	16	3S	77W	9000	5/2	14.1	4.8	6.2	10.7	13	5.4
Fiddler Gulch	44 "	1	8S	80W	11000	5/2	39.8	14.4	18.7	19.5	12	14.5
Nast	45 "	1	9S	83W	8700	5/2	4.0	1.5	1.2	2.3	13	1.1
Mesa Lakes	56 "	35	11S	96W	10000	5/3	32.6	12.9	19.4	18.5	12	16.5
Lulu	59 "	25	6N	76W	10200	4/30	52.0	19.2	20.5	21.6	9	19.2
Willow Creek P.	62 "	1	4N	78W	9500	5/2	37.0	13.7	10.4	16.1	11	12.2
N.Inlet Grand L.	64 "	26	4N	75W	9000	4/30	17.8	5.2	6.3	10.9	11	7.8
Lake Irene	65 "	8	5N	75W	10600	4/29	62.6	26.1	24.2	27.1	11	23.4
Thunderbolt Peak	66 "	22	2N	74W	9500	4/17	33.8	14.7	15.9	15.3	11	14.4
Arrow	69 "	34	1S	75W	9900	4/29	26.5	6.4	9.0	11.2	11	7.2
Lapland	70 "	16	2S	76W	9300	4/29	19.8	7.6	16.0	13.1	11	8.2
Fremont Pass #2	79 "	2	8S	79W	11400	4/27	48.6	14.9	20.7	22.0	13	17.1
Trickle Divide	85 "	23	11S	94W	10000	4/28	69.1	28.9	30.3	33.5	9	31.9
Lynx Pass	91 "	27	2N	83W	9100	4/28	21.0	6.6	11.8	16.0	13	8.8
Shrine Pass	96 "	15	6S	79W	10500	4/27	48.9	16.3	21.2	23.2	7	17.6
Grizzly Peak	97 "	2	5S	76W	11250	4/28	47.0	15.8	20.5	23.0	7	18.5
Ivanhoe	100 "	12	9S	82W	10400	4/26	50.8	23.1	18.7	19.7	3	15.4
Glen-Mar Ranch	102 "	31	12S	77W	8850	5/2	9.8	3.6	5.6	8.6	2	7.1
Monarch Lake	106 "	30	2N	94W	8500	4/17	0.0	0.0				
Granby	113 "	11	2N	77W	8700	4/29	9.2	2.5				
Grand Lake	127 "	36	4N	75W	8600	4/29	12.5	4.4				
				Average for drainage			33.7	12.1	14.8	17.2		13.2

*On adjacent drainage

COLORADO RIVER SNOW SURVEYS, May 1, 1949

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurements: Water Content (Inches) 1949	1948	1947	Past Record: Yrs. of Rec.	Av. water Content (Inches)
YAMPA RIVER												
Dry Lake	6 Colo	26	7N	84W	8200	4/30	28.8	16.5	17.5	18.5	13	15.0
Columbine Lodge	8 "	21	5N	82W	9300	4/28	47.5	21.4	22.4	20.0	13	19.0
Elk River	9 "	6	10N	85W	8700	5/1	32.0	11.3	11.2	12.4	13	12.2
Lynx Pass	91 "	27	2N	83W	9100	4/28	21.0	6.6	11.8	16.0	13	8.8
Old Battle	9 Wyo.	29	14N	85W	9800	5/2	75.1	36.9	34.9	36.2	13	32.5
		Average for drainage					40.9	18.5	19.6	20.6		17.5
WHITE RIVER												
Burro Mountain	35 Colo.	15	2S	91W	9000	5/2	38.2	16.2	15.7	20.3	13	15.1
Rio Blanco	36 "	28	1N	88W	8500	5/1	29.3	13.3	9.4	14.5	13	9.3
		Average for drainage					33.8	14.8	12.6	17.4		12.2
ROARING FORK												
Ind. Pass Tunnel	33 Colo.	30	11S	82W	10200	5/3	34.9	13.7	20.3	27.4	13	17.1
N. Lost Trail Cr.	34 "	20	11S	87W	9200	4/30	14.4	6.7	10.9	10.6	13	10.2
Nast	45 "	1	9S	83W	8700	5/2	4.0	1.5	1.2	2.3	13	4.4
Ivanhoe	100 "	12	9S	82W	10400	4/26	50.8	23.1	18.7	19.7	3	15.4
		Average for drainage					17.8	7.3	10.8	13.4		10.6
GUNNISON RIVER												
Crested Butte	18 Colo.	22	13S	86W	9000	4/29	12.3	5.7	10.4	12.1	13	6.8
Marshall Creek	42 "	24	48N	6E	10800	5/1	32.7	12.4	12.3	12.1	13	10.4
Poncha Creek*	43 "	19	48N	7E	10500	5/1	27.8	9.2	11.7	11.1	13	8.6
Park Cone	46 "	19	14S	82W	9700	5/1	23.1	5.2	13.9	9.0	12	4.7
Alexander Lake	53 "	2	12S	25W	10000	4/29	58.1	24.8	27.0	25.8	12	24.4
Snowshoe Mesa	55 "	14	13S	89W	7500	4/29	0.0	0.0	6.6	0.0	12	1.2
Ironton Park	58 "	29	43N	7W	9800	5/1	11.2	4.0	9.3	10.7	12	9.5
Trickle Divide	85 "	23	11S	94W	10000	4/28	69.1	28.9	30.3	33.5	9	31.9
Park Reservoir	87 "	34	11S	94W	9500	4/29	59.0	26.0	26.8	28.7	9	26.7
Porphyry Creek	89 "	19	49N	6E	10800	4/27	47.7	17.0	19.4	18.9	9	17.4
Hannah Creek	101 "	5	12S	95W	10700	5/3	57.5	22.6	29.6	29.3	2	29.4
Lake City	104 "	13	43N	4W	10300	5/1	15.5	5.2	4.2	--	1	--
Spring Cr. Pass	123 "	2	42N	3W	10900	4/29	26.9	10.8	--	--		
Cochetopa Pass	126 "	12	45N	3E	10000	5/2	11.1	4.1	--	--		
		Average for Drainage					34.1	13.3	16.7	16.2		14.2

*On adjacent drainage

COLORADO RIVER SNOW SURVEYS, MAY 1, 1949

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Course Measurements: Water Content (Inches) 1949	1948	1947	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
					COLORADO RIVER			In.	In.	In.		
SAN JUAN RIVER												
Wolf Creek Pass*	26 Colo.	4	37N	2E	10000	4/27	77.7	39.5	36.0	17.5	13	26.8
Upper San Juan	29 "	10	37N	1E	10000	4/27	87.8	43.8	42.3	19.7	13	31.1
Silverton Sub.S.	30 "	10	41N	7W	9400	4/30	0.0	0.0	0.0	0.0	13	1.4
Cascade	31 "	12	39N	9W	8850	4/30	0.0	0.0	0.0	0.0	13	3.1
Granite Peaks	93 "	24	37N	6W	7950	4/30	0.0	0.0	0.0	0.0	8	1.1
Chama Divide	17 N.Mex.		36.9N	106.7W	7750	4/30	0.0	0.0				
Chamita*	18 "		36.9N	106.7W	8500	4/29	2.4	1.3				
	Average for Drainage						33.1	17.6	15.7	7.4		
ANIMAS RIVER												
Silverton Sub.S.	30 Colo.	10	41N	7W	9400	4/30	0.0	0.0	0.0	0.0	13	1.4
Cascade	31 "	12	39N	9N	8850	4/30	0.0	0.0	0.0	0.0	13	3.1
Ironton Park*	58 "	29	43N	7W	9800	5/1	11.2	4.0	9.3	10.7	12	9.5
	Average for Drainage						3.7	1.3	3.1	3.6		4.7
DOLORES RIVER												
Rico	23 Colo.	11	39N	11W	8700	4/28	0.0	0.0		0.0	13	1.4
Telluride	24 "	6	42N	8W	8600	4/29	0.0	0.0	0.0	0.0	13	1.5
Lizard Head	25 "	24	41N	10W	10300	4/28	43.6	24.7	--	11.1	13	15.3
Trout Lake	114 "	8	41N	9W	9700	5/1	24.0	9.0				
	Average for Drainage						14.5	8.2	--	--		6.1
GREEN RIVER												
East Rim Divide	44 Wyo.	32	37N	111W	7950	4/29	27.0	9.8		7.0	3	
Dutch Joe	23 "	33	31N	104W	8700	5/1	0.9	0.4	4.3	5.9	13	3.3
Mulligan Park	24 "	17	35N	108W	8900	5/2	9.6	3.4	4.6	11.7	13	6.2
Kendall R.S.	25 "	23	38N	110W	7900	5/2	23.6	9.4	4.0	9.8	13	5.0
Loomis Park	26 "	14	37N	111W	8500	5/1	17.5	7.9	11.3	13.5	13	9.4
Snyder Basin R.S.	27 "	15	29N	114W	8040	5/1	15.6	6.4	10.4	10.7	13	7.0
Piney-LaBarge	28 "	19	29N	114W	8820	5/1	21.6	8.7	16.0	16.6	13	12.8
	Average for Drainage						14.8	6.0	8.4	11.4		7.3

*On adjacent drainage

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds of Colorado, Kansas or Nebraska.

STATE

Colorado State Engineer
Cooperative Snow Surveyor
Grand River Engineer
New Mexico State Engineer
Nebraska State Engineer
Nebraska Experiment Station
Colorado Extension Service
Colorado Experiment Station
Utah Experiment Station

FEDERAL

Department of Agriculture
Forest Service
Soil Conservation Service
Department of Interior
Bureau of Reclamation
Geological Survey
National Park Service
Department of Commerce
Weather Bureau
War Department
Army Engineer Corps

POWER UTILITIES

Colorado Public Service Company
Western Colorado Power Company
Montana Power Company
Public Service Company of New Mexico
Denver and Rio Grande Western R. R. Company

MUNICIPALITIES

City of Colorado
City of Denver
City of Boulder

WATER USERS ORGANIZATIONS

Fountain Valley Water Users Association
Arkansas Valley Users Association
Colorado River Water Conservation District

MANUFACTURING PLANTS

Amherst Reservoir and Irrigation Company
San Luis Valley Irrigation District
Santa Maria Reservoir Company
Costilla Land Company
Uncompahgre Valley Water Users Association
Wyoming Development Company
Ouray Irrigation District
Rocky Ford Irrigation District
Salt River Valley Water Users' Association
San Carlos Irrigation and Drainage District
Twin Lakes Reservoir and Canal Company

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